

REMARKS

Claims 1, 2, 5, 8, 9, 17-19 and 22-34 are all the claims pending in the application. By this Amendment, Applicant amends claims 2 and 23 to further clarify the features set forth therein and claims 5, 24, 27, and 32 for consistency therewith.

I. Preliminary Matters

As preliminary matters, Applicant thanks the Examiner for returning the initialed Form PTO/SB/08 submitted with the Information Disclosure Statement filed on February 29, 2008. Applicant also thanks the Examiner for indicating acceptance of the drawing figures filed on January 9, 2006.

II. Summary of the Office Action

The Examiner withdrew the previous grounds of rejections. The Examiner, however, found new grounds for rejecting the claims. Specifically, the Examiner rejected claims 1, 2, 5, 8, 9, 17-19, and 22-34 under 35 U.S.C. § 103(a).

III. Prior Art Rejection

Claims 1, 2, 5, 8, 9, 17-19, and 22-34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,517,180 to Tullis et al. (hereinafter “Tullis”) in view of U.S. Patent No. 6,527,360 to Otsuki et al. (hereinafter “Otsuki”) and U.S. Patent No. 5,898,443 to Yoshino et al. (hereinafter “Yoshino”). Applicant respectfully traverses these grounds of rejection at least in view of the following exemplary comments.

Of these rejected claims, only claims 2 and 23 are independent. These independent claims 2 and 23 recite in some variation and *inter alia* “a plurality of block patterns are formed

on said medium lined up in a straight line in said moving direction, said second sensor detects said plurality of block patterns that are lined up in said moving direction while said second sensor moves once in said moving direction.”

In an exemplary embodiment, nine block patterns corresponding to nozzles #1-#9 are formed lined up in a straight line along the scanning direction. Thus, each block pattern corresponds to a nozzle forming that block pattern. If there are non-ejecting nozzles (nozzles that do not eject ink), then, blank patterns occur in the test pattern. That is, by detecting whether or not there are blank patterns, it is possible to test whether or not there are non-ejecting nozzles. Moreover, by detecting the position of those blank patterns, it is possible to identify the non-ejecting nozzles (Fig. 19). In other words, according to this arrangement of block patterns, the sensor can move only once in the moving direction while detecting these block patterns lined up in the moving direction. It will be appreciated that the foregoing remarks relate to the invention in a general sense, the remarks are not necessarily limitative of any claims and are intended only to help the Examiner better understand the distinguishing aspects of the claims mentioned above.

The prior art of record do not disclose or suggest at least the above-quoted unique features of claims 2 and 23. The Examiner acknowledges that Tullis does not disclose or suggest the first and second sensors arranged in the moving direction and the second sensor performing the detection set forth in claims 2 and 23 (*see page 6 of the Office Action*). Otsuki does not cure the above-identified deficiencies of Tullis.

Otsuki discloses a carriage 31 of the print head which is provided with a photoreflector 33b that is disposed on the surface facing the platen 26. The position of the photoreflector 33b in

the sub-scanning direction matches the position of those nozzles facing an upstream slot 26f that are disposed on the downstream side in the sub-scanning direction. The photoreflector 33b is designed to confirm the presence of printing paper P at a specific point DP2 in the connection area 26g between the upstream slot 26f and a left slot 26a (col. 7, lines 13 to 17). Otsuki, however, only discloses photoreflectors that detect the paper and fail to disclose or suggest a photodetector that moves only once in the sub-scanning direction detecting a number of block patterns that are lined up in the scanning direction.

Similarly, Yoshino does not cure the above-identified deficiencies of Tullis and Otsuki. Yoshino discloses a test printing method for detecting ejecting condition of the liquid ejection head where the printing head and the treatment liquid ejection head respectively have 8 ejection openings. As shown in FIG. 15A of Yoshino, the liquid ejection head prints a given length of a ruled line pattern per pixel corresponding to each ejection opening, sequentially in stepwise fashion. On the other hand, the printing head of the Bk ink performs so-called solid printing utilizing all ejection openings, as shown in FIG. 15B. In Yoshino, the image data obtained by composing the images of FIGS. 15A and 15B is shown in FIG. 15C. When the image data shown in FIG. 15C is printed on the printing paper, the ink and the liquid are overlaid at the portion where the liquid is ejected to have higher print reflection density only at that portion, as shown in FIG. 16. In certain cases, the hue is slightly varied at the portion where the ink and the liquid are overlaid. Therefore, normal ejecting condition of the liquid can be visually perceptible (Figs. 15-18; col. 15, line 66 to col. 17, line 25).

Yoshino discloses eight patterns for testing ejecting condition of eight nozzles but they are not formed on the paper lined up in a straight line in the scanning direction. That is, Yoshino does not disclose or suggest detecting eight patterns while the sensor moves once in the scanning direction. In other words, even if a sensor for detecting the patterns can move in the scanning direction together with the head, in Yoshino, it will take more than one move in scanning direction to detect the eight patterns. In short, Yoshino does not cure the above-identified deficiencies of Tullis and Otsuki.

Therefore, none of cited references suggest that “a plurality of block patterns are formed on said medium lined up in a straight line along said moving direction....said second sensor detects said plurality of block patterns that are lined up in said moving direction while said second sensor moves once in said moving direction,” as set forth in claims 2 and 23. For at least these exemplary reasons, claims 2 and 23 are patentable over Tullis in view of Otsuki and Yoshino. Accordingly, Applicant respectfully requests the Examiner to withdraw this rejection of claims 2 and 23 and their dependent claims 1, 5, 8, 9, 17-19, 22, and 24-33.

IV. Conclusion

Entry and consideration of this Amendment are respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. Application No.: 10/563,877

Attorney Docket No.: Q92020

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Date: November 18, 2008